DEPARTMENT OF DEFENSE

DoD Enterprise Architecture Executive Summary

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By

DoD EA Congruence Community of Practice

THE DOD EA RM EXECUTIVE SUMMARY

BACKGROUND

The Department of Defense Enterprise Architecture Reference Model (DoD EA RM) set is a business and performance-based framework for cross-organization, DoD- and government-wide improvement. It provides DoD and the Office of Management and Budget (OMB) with a new way of describing, analyzing, and improving Information Technology (IT) governance and its ability to serve the citizen. The lack of a DoD EA RM set to support cross-DoD collaboration is a key barrier to the success of the Secretary of Defense (SECDEF) transformation goals and the initiatives approved by the President's Management Council in October 2001.

The DoD EA RM is the collection of five DoD enterprise-level reference models: the DoD EA Business Reference Model (DoD EA BRM), the DoD EA Service Component Reference Model (DoD EA SRM), the DoD EA Technical Reference Model (DoD EA TRM), the DoD EA Data Reference Model (DoD EA DRM), and the DoD EA Performance Reference Model (DoD EA PRM).

Led by the Office of the DoD Chief Information Office (CIO), the purpose of the set of DoD EA RMs is to identify opportunities to simplify processes, re-use IT investments, and unify work across the Department and within the lines of business across the government. Together, these five models provide the DoD with an enterprise-level asset containing the Common Terms of Reference or taxonomy required for achieving both internal and external regulatory compliance, interoperability, and net centricity.

The outcome of this effort will better achieve mission outcomes by maximizing technology investments. While DoD provides a unique line of business for the nation's citizen, it also provides a specialized set of services for the citizens who are a part of the DoD enterprise, to include warrior and dependents. Since DoD provides many services similar to those of other Cabinet-level agencies, such as transportation, education, and health, opportunities may exist for cross-Agency collaboration to improve services for the citizens while substantially reducing the cost of providing those services.

According to the OMB Circular A-11 guidance, Cabinet-level agencies, including DoD, must link their budget submission Exhibit 300s to Agency EAs and the Federal Enterprise Architecture (FEA) RMs. The FEA BRM Version 2.0 was released to agencies on June 12, 2003, to support the fiscal year 2005 budget formulation process. A DoD supplement that incorporates sub-functions under the Defense and National Security Line of Business was published shortly thereafter. The FEA SRM, TRM, PRM and DRM were released during the spring and early summer of 2003. Cabinet-level agencies were asked to validate the alignment of the FY2005 IT 300 Exhibits with the FEA in March of 2004.

DoD EA RMs are designed to be used by DoD Program Managers as a mechanism for aligning their IT 300 Exhibits with the DoD EA and with the FEA as required by OMB Circular A-11. The content will also be used by DoD Components and the Office of the Secretary of Defense (OSD) as business-based models to facilitate cross- organizational analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within and across DoD components. The value of the DoD EA RMs also accrues to the OMB for the same purposes and to other stakeholders. The DoD EA RM V.03 was used in 2004 by several DoD organizations, including the Air Force and Army, to assist in submission of the IT300s for their programs.

The content of the DoD set of reference models is traceable to the FEA RMs while leveraging existing DoD standards for structure, business rules, and content. The

mapping to the FEA RMs provides DoD with a standardized approach for the EA portion of the OMB Budget process. Existing DoD standards for structure, business rules, and content are leveraged to achieve interoperability and net centricity. DoD also realizes opportunities for eliminating redundant IT and reducing or avoiding unnecessary IT costs while improving performance through enablement of improved business processes.

For more information about the current version of the DoD EA RMs, please see http://www.dod.mil/nii/. The current version of the FE reference models is posted at http://www.whitehouse.gov/omb/egov/. OMB Circular A-11 guidance, which outlines the requirements and questions in the FY 2005 OMB Exhibits 53 and 300 for IT investments, is posted at http://www.whitehouse.gov/omb/egov/b-1-information.html. OMB guidance becomes available for future fiscal years, it will also be posted at this location.

ENTERPRISE PERSPECTIVE

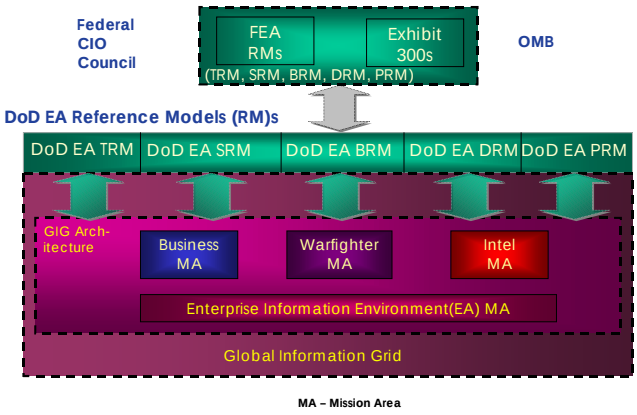

Figure 1. FEA, DoD Architectural Relationships

The DoD and Federal architectural relationship is described by an over-arching organizational construct, **Figure 1**, which consists primarily of DoD EA RMs that are traceable to the OMB FEA RMs. This DoD set of RMs serves as a mechanism for relating the DoD Global Information Grid (GIG), the GIG Architecture, the Business, the Warfighter, the Intelligence, and the Enterprise Information Environment (EIE) Mission Areas to the FEA set of RMs for Capital Planning purposes. From an internal DoD perspective, specific mission architectures are tailored and extended to develop more tightly integrated architectures. The more tightly integrated architectures in DoD are developed using the DoD Architecture Framework (DoDAF). These more tightly integrated architectures produce information that is by abstraction presented in the set of DoD EA RMs. This concept is illustrated in **Figure 2**.

The DoD EA RMs are documented using information from the FEA RMs and DoD architectures and other source information. Gap analyses and recommendations to improve the mapping of the architecture reference models are made to the FEA-PMO and DoD enterprise architectural team.

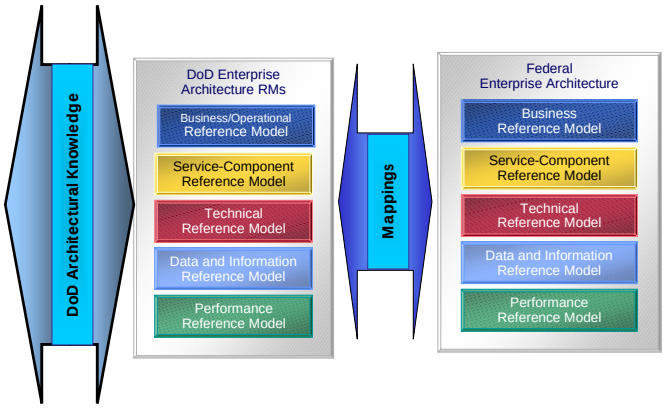

Figure 2. Abstraction of Resources and Mappings

The DoD EA RMs serve several purposes, but they primarily provide a frame of reference for addressing the EA sections of the OMB Circular A-11 as DoD program staffs prepare their business cases for IT Investments (a.k.a. IT 300 Exhibits). The reference models also provide a common set of terms and definitions that can be used by all DoD architects so that their separately developed mission, business area, or program level architectures can be related, compared, and reused, i.e., the same term or entity represents and means the same thing in each separately developed architecture.

DOD ENTERPRISE ARCHITECTURE REFERENCE MODELS

The DoD EA RMs are comprised of a macro abstraction and five (5) reference models. Collectively, they will provide universal definitions and constructs of the business, performance, and technology of the DoD and its alignment with the FEA RMs. This set of DoD EA RM(s) will serve as a foundation to leverage existing processes, capabilities, components and technologies as DoD and other government organizations build target enterprise architectures. They are designed to facilitate cross-organizational analysis and the identification of duplicative investments, gaps, and opportunities for collaboration within DoD and across Federal agencies and other government organizations.

The structure of the reference models are designed for the Program Manager who must associate his or her IT initiative's business case (IT 300 Exhibit) with the DoD EA and the FEA in support of the budget formulation process, as required by OMB Circular A-11. The DoD EA RM content is mapped to the FEA. By easily finding the associations between the DoD EA and the FEA, the Program Manager is able to reduce the labor cost required to perform the analysis necessary to comply with the A-11 guidance. The mappings are contained in the DoD EA RM document appendices.

The DoD EA RMs are described more fully in the following paragraphs and are listed in the order of maturity.

DoD EA BRM

The DoD EA BRM is a framework for describing the business of DoD independent of the DoD organizations that perform it, and serves as the foundation for the other DoD EA RMs. By identifying the DoD sub-functions in the DoD EA BRM the Program Manager easily finds his or her mapping to the FEA line of business and subfunction. The DoD resources used for the DoD EA BRM include the Universal Joint Task List (UJTL), the Business Enterprise Architecture (BEA), the Intelligence Community Enterprise Architecture (IC EA),

and the Net-Centric Operations and Warfare Reference Model (NCOW RM) V1.1. This mapping further contributes to the description of the Federal Government's Lines of Business, including its internal operations and its services for the citizen, independent of the DoD organizations that perform them.

By describing the Federal Government around common business areas instead of the stove-piped, agency-by-agency views, the DoD EA BRM should help promote organizational collaboration within DoD, among Cabinet-level agencies and other government organizations.

DoD EA SRM

The DoD EA SRM is a business-driven, functional framework that classifies Service Components with respect to how they support the business or mission area of the Department. The DoD EA SRM is structured across horizontal service areas that, independent of the business functions, can provide a "leverageable" foundation for reuse of applications, application capabilities, components, and business services. The DoD EA SRM provides a key enabler for the Department's transformation by establishing the Department's foundation for managing the Department's Service Components in a net-centric environment.

The DoD resources used for the DoD EA SRM include the Common System Functions List (CSFL), the Intelligence Common Functions List, the Business Enterprise Architecture, the NCOW RM V1.0, and the Net Centric Enterprise Services.

DoD EA TRM

The DoD EA TRM is a hierarchical foundation used to describe how technology standards and specifications support the delivery of Service Components and capabilities. The DoD EA TRM outlines the technology elements that collectively support the adoption and implementation of component-based architectures, as well as the identification of proven products and toolsets that are embraced by government-wide initiatives and shown in the FEA TRM.

The DoD EA TRM provides a key enabler for the Department's transformation by documenting the Department's foundation for managing its IT standards and specifications in a net-centric environment.

The DoD resources used for the DoD EA TRM include the Joint Technical Architecture and the NCOW RM V1.1 Target Technical View.

DoD EA PRM

The DoD EA PRM is a framework for performance measurement that provides common outcome and output measures throughout the DoD and for association with the FEA PRM. It allows DoD to better manage the alignment of IT with the business of Defense at a strategic level while providing a means for gauging progress towards the targeted goals. The model articulates the linkage between IT and the achievement of mission and customer-centric outcomes. For example, the DoD has a number of transformation goals, which are tempered by risk. For each of the risk categories, and subcategories, a performance metric is developed. Each DoD IT initiative should be associated with one or more of these performance metrics. These performance metrics may be found in the DoD planning guidance published by the Under Secretary of Defense (Comptroller) (USD(C)), Plans and Evaluation. Program Managers should use the measurement areas

and measurement categories to properly categorize the measurement indicator for their IT initiative.

DoD EA DRM

The DoD EA DRM describes an approach for identifying data and information at an aggregate level to support program and business line operations. The DoD EA DRM is based on DoD's Data Strategy and the FEA Data Management Strategy. This reference model will establish a commonly understood classification for Department data and leads to the identification of duplicative data resources, as well as enable information sharing between DoD Components and Federal Agencies.

The Program Manager will be expected to know the classification of data with which his or her IT initiative is associated, and record it according to OMB Circular A-11, guidance for preparing IT 300 Exhibits. The DoD EA DRM will be produced on a business line by business line basis, or in DoD parlance, produced on a Community of Interest (COI) basis as opposed to a single cumulative effort. It will categorize the Department's information along with general content areas specific to the DoD EA BRM sub-functions and decompose those content areas into greater levels of detail, ultimately to data components that are common to many business processes or activities across the entire spectrum of the Department, and Federal, state, and local governments.

The DoD EA DRM will aid in describing the strategies for understanding the complex interactions that occur within the Department and across Federal, state, and local governments and among various customers, constituencies, and business partners. A common data strategy, as described in the DoD EA DRM, will help streamline the processes associated with managing data in the Federal government and between the government and its external stakeholders.

The DoD resources used for the DoD EA DRM include the DoD Net-Centric Data Strategy, the DoD Discovery Metadata Standard (DDMS), and the BEA DRM .

SUMMARY GUIDELINES FOR USING THE DOD EA REFERENCE MODELS

DoD Program Managers should use the DoD EA RMs in preparation of their IT 300 Exhibits according to OMB Circular A-11 guidance. In general, by identifying the DoD sub-functions, service components, technical standards and specifications, macro data category, performance measurement area, performance measurement category, and "operationalized" performance measurement indicator, the Program Manager can easily find his or her mapping to the FEA RM.

Figure 3 illustrates an example of the relationship between the reference models. The Line of Business (LOB) sub-function of Defense and National Security is supported by the Focused Logistics/GCSS Service Component. This relationship is enabled by the IT standards that make GCSS member systems interoperate and share GCSS COI data. GCSS data are that which is needed to satisfy the Combatant Commanders' 129 information requirements. The IT and functional performance measures are to be categorized by the taxonomy found in the DoD EA PRM.

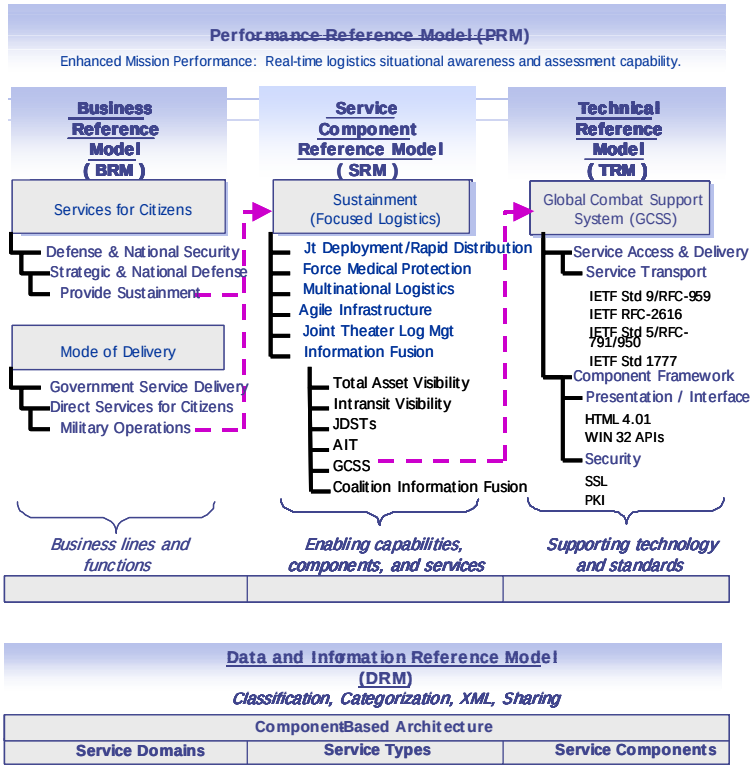

Figure 3. Visual Relationship Illustration

BENEFITS OF THE DOD EA REFERENCE MODELS

DoD Benefits

The DoD EA RM provides vision into the DoD-wide architecture, giving each DoD Component a collection of new capabilities from which to choose from for defining and implementing their target EA environments. Components will now be able to:

- Save time and money by leveraging reusable business processes, data, and IT-components in other DoD Components and other Federal Agencies.
- Leverage DoD work products as a catalyst for DoD Component-specific EA efforts.
- Leverage FEA work products as a catalyst for DoD EA specific efforts.
- Ensure proposed investments are not duplicative with those of other DoD Components and other Federal agencies – prior to developing business cases and submitting them to OMB.
- Suggest modifications to the DoD EA RMs to ensure future versions accurately portray the Capabilities and Service Components of industry and government, including the role specific agencies play.
- Meet requirements for OMB IT 300 budget submission by aligning to the FEA RMs.

Other Beneficiaries

The DoD EA RMs provide benefits to the Federal Government as a whole. The DoD EA RMs provide vision into the federal-wide architecture giving each agency an exposure to a collection of new capabilities from which to choose for defining and implementing

their target EA environments. The DoD EA alignment with the FEA also provides both the policy and budget organizations of DoD and OMB with a greatly enhanced cross-DoD Component and cross-Cabinet level agency analytical capability. Through the analysis of the DoD EA, as aligned with the FEA, DoD will be able to see opportunities for collaboration of processes, data, services, and technology across DoD Components. OMB will be able to see opportunities for collaboration of processes, data, services, and technology across Federal Agencies and Governments. Examples of the benefits to both DoD and OMB include:

- Elimination or consolidation of redundant investments in IT capabilities, business processes, or other capital assets
- Identification of common business functions across DoD Components
- Integration of performance measurement with the budget process along the key business lines of the government

Other federal agencies will be able to:

- Save time and money by leveraging reusable business processes, data, and IT-components in DoD and vice versa.
- Leverage DoD EA work products as a catalyst for agency-specific EA efforts.
- Ensure proposed investments are not duplicative with those of other agencies, to include DoD, prior to developing business cases and submitting them to OMB.
- Suggest modifications to the EA to ensure future versions accurately portray the Capabilities and Service Components of industry and government, including the interplay of roles that specific agencies play.

Congress realizes benefits from the reference models. DoD EA alignment with the FEA will yield a wealth of information on Federal business lines, programs and capital investments and the performance of those business lines, programs, and capital investments. This information will be made available to Congress as it considers the authorization of, and appropriation of, funding for Federal programs, and as it fulfills its oversight responsibilities on behalf of the citizen. As deficits grow and greater demands are placed on the federal Infrastructure to protect and defend our homeland, DoD and other federal agencies must be ever more diligent to ensure that our limited federal resources are spent wisely and to ensure that the taxpayer is getting the most from his or her tax dollar. By working with Congress DoD and other Federal Agencies must ensure that the taxpayers' money is spent most efficiently and effectively. IT resources, in particular, must ensure that enabling IT enhances mission performance while substantially reducing the cost of government.

Benefits also accrue to the citizen. The true driver behind the DoD EA is the need to improve the government's delivery of services both to and for the public. The agency-centric systems and processes that have previously characterized government must be replaced with integrated, citizen-centric applications and processes. The DoD EA, through its support of the President's management agenda, as well as other cross-agency, citizen-focused Federal Architectural efforts, is a key component of the citizen-focused transformation in government. Citizens who are part of the DoD Enterprise are the warfighter and his/her dependents, as well as civilian DoD support staff.

RELATED AND ONGOING DOD PROGRAMS AND PROJECTS

DoDAF v2.0

JCIDS

Portfolio Management

Visualization tools

THE DOD EA CONGRUENCE COMMUNITY OF PRACTICE

The DoD EA Congruence Community of Practice (COP) was established to provide the definition and development of the DoD EA, and to ensure its congruency with the FEA. The DoD EA COP executes tasks according to the Work Plan, which it develops, and manages and coordinates activities surrounding:

- Definition of the DoD EA through a set of DoD-wide reference models focusing on business, performance, service components and capabilities, technologies and standards, and data and information.
- Development of a core set of standardized Component-based Architecture models to facilitate technology solutions and the development of a complete architecture (baseline, target, and transition) to align with the FEA and to support the President's Management Agenda.
- Assessment and identification, through high-level architecture, critical success factors, and Line of Business performance information, of new opportunities for business process and system consolidation to improve DoD and government efficiency and effectiveness.
- Participation in the development of a Web-based FEA repository, called the Federal Enterprise Architecture Management System (FEAMS), to provide agencies with a view of cross-agency information and the alignment of IT investments to areas of the FEA.

The DoD EA Congruence COP is composed of representatives from various DoD Components. The Support Team is responsible for delivering work products, for example, the DoD EA RMs, to align with the FEA RMs. DoD EA COP also coordinates with various stakeholders incorporating comments, as appropriate, to produce a final product. The DoD EA COP has created, and maintains, the following Website to help ensure that DoD EA information is shared: http://www.dod.mil/nii/.

The DoD's Chief Architect's Office in the Office of the DoD CIO provides leadership for the DoD EA RMs. The Chief Architect's Office is responsible for ensuring the overall success of the DoD EA RMs, overseeing the completion of project tasks, and securing the approval of project deliverables by senior DoD officials and the projects' stakeholders, e.g., Business Modernization Management Program (BMMP), The Joint Staff, DoD Components, and senior DoD IT, planning, budget, and procurement staff.

ARCHITECTURE AND INFRASTRUCTURE COMMITTEE (AIC) – GOVERNANCE AND COMPONENTS SUBCOMMITTEE

The Federal CIO Council, Architecture and Infrastructure Committee (AIC), Governance (GC), Components (C) and Emerging Technology (ET) subcommittees were established to foster the identification, maturation, use, and reuse of Component-based Architectures and Architectural Components in the Federal Government. DoD serves as the AIC Chair and the Governance Subcommittee Co-chair, sharing this responsibility

with the Chief Architect of the Federal Government. DoD also has representation on both the Component and Emerging Technology subcommittees. The underlying objectives of the AIC and its subcommittees are to foster the basic principles of interoperability, reusability and portability of processes, services and infrastructure components by Federal Agencies and related partners and stakeholders as they modernize their business processes through data sharing, e-government automation, and improved information systems.

The efforts of the subcommittees will be directed toward achieving these outcomes:

- Identification of business processes, service components, and technologies for re-use through analysis of the FEA Service Component and TRMs
- Reduction of IT costs for Federal Agencies achieved through the re-use of business processes, service components, and technologies.
- Rapid solution development through the re-use of components
- Rapid integration of disparate business services
- Development and implementation of e-Gov solutions based on component-based architectures

KEY TERMS

This list is under construction. Relevant DoD terms will be added. Not all DoD terms but s key ones.

This Appendix provides a list of key terms and acronyms and list of primary sources used to develop the DoD EA RM. Since the DoD EA RM used the FEA RM as a foundation, the Federal acronyms and list of primary sources are listed for the readers' information.

BRM – Business Reference Model, one of the five models in the Federal Enterprise Architecture reference model framework.

CFO – Chief Financial Officer, generally responsible for agency-wide budget and performance measurement activities.

CIO – Chief Information Officer, generally responsible for agency-wide IT and information management activities.

CTO – Chief Technology Officer, generally responsible for agency-wide IT management activities.

DME – Development, Modernization, or Enhancement, an IT initiative funding category depicting IT efforts other than maintenance or "steady state."

DRM – Data Reference Model, one of the five models in the Federal Enterprise Architecture reference model framework.

EA – Enterprise Architecture, the discipline of creating a blueprint of an agency's business, data, applications, and technology.

FEA – Federal Enterprise Architecture, the collection of five inter-related reference models designed to spur cross-agency analysis and collaboration.

FEAMS – Federal Enterprise Architecture Management System, a read-only Web-based system that will allow selected federal staff to view how major IT initiatives align with the FEA reference models.

FEA-PMO – Federal Enterprise Architecture Program Management Office, the office within the U.S. Office of Management and Budget that is developing the FEA reference model framework.

GPRA – Government Performance and Results Act, requires agencies to produce Strategic Plans, Performance Plans, and Performance Reports.

IT CPIC – IT Capital Planning and Investment Control, set of federal and agency processes designed to Select, Control, and Evaluate IT investments.

IT Project Manager – The individual responsible for managing an IT investment activity.

Line of Business Owner – An agency that has been designated by the President's Management Council to lead federal-wide collaboration around a Line of Business or Sub-function in the Business Reference Model.

Line of Sight – The indirect or direct cause and effect relationship from a specific IT investment to the processes it supports, and by extension the customers it serves and the mission-related outcomes it contributes to.

Managing Partner – The Federal Agency that has the lead on one of the 24 Presidential E-Government Initiatives.

Measurement Area – The highest level organizing framework of the FEA Performance Reference Model.

Measurement Category – Groupings of Generic Measurement Indicators within each FEA Performance Reference Model Measurement Area.

Measurement Indicator – Generic measurements organized within a FEA Performance Reference Model Measurement Category. These are the starting points for agencies to create the Operationalized Measurement Indicators for their specific environment.

Operationalized Measurement Indicator – The indicator that an agency creates that is uniquely tailored to the agency's specific environment.

PART – Program Assessment Rating Tool, a set of program evaluation questions used to analyze federal programs that is part of the President's Budget and Performance Integration initiative.

PRM – Performance Reference Model, one of the five models in the FEA reference model framework.

Program Manager – A business official that is responsible for making decisions and managing a federal program or process.

SRM – Service Component Reference Model, one of the five models in the FEA reference model framework.

TRM – Technical Reference Model, one of the five models in the FEA reference model framework.

PMA – President's Management Agenda, the list of federal-wide initiatives the President has identified as critical to improving government. These are Budget and Performance Integration, Competitive Sourcing, Expanding E-Government, Improved Financial Management, and Strategic Management of Human Capital.

LIST OF SOURCES

This list is under construction. The sources used for the DoD EA Reference Models will be listed for the reader's reference.

These are some of the primary sources that were used to develop the DoD EA RMs. DoD organizations may find this list useful, as they seek additional guidance and perspective on the using reference models for unifying complex architectures for executive-level presentation, capital planning, and for improving the efficiency and effectives of complex organizations. In addition, these references may provide insights about the specific disciplines of business-driven architectures, service-component architectures, data management, and performance measurement.

1. Business Enterprise Architecture Version 2.0., Feburary 27, 2002.
2. CHAIRMAN OF THE JOINT CHIEFS OF STAFF MANUAL 3500.04C (Universal Joint Task List (UJTL), 1 July 2002, http://www.dtic.mil/doctrine/jel/cjcsd/cjcsm/m350004c.pdf.
3. Chief Financial Officers Act of 1990.
4. Clinger-Cohen Act of 1996.
5. Defense Information Systems Agency, Net-Centric Enterprise Services.
6. Department of Defense Financial Management Modernization Program, "DOD Financial Management Enterprise Architecture," 2002.
7. NCOW Reference Model Version 1.0, https://disain.disa.mil/ncow.html.
8. E-Government Act of 2002.
9. Federal Acquisition Streamlining Act of 1994.
10. Federal Financial Management Improvement Act of 1996.
11. Federal Program Management Office, Business Reference Model (BRM) v2.0 Released, June 12, 2003.
12. Federal Program Management Office, Service Component Reference Model (SRM) v1.0 Released, June 12, 2003.
13. Government Performance and Results Act of 1993.
14. Government Paperwork Elimination Act of 1998.
15. Office of Management and Budget, Federal Enterprise Architecture Program Management Office, "The Business Reference Model Version 1.0," July 2002.
16. Office of Management and Budget, "OMB Circular A-11," 2002.
17. Office of Management and Budget, "OMB Circular A-130," 2001.
18. Office of Management and Budget, "Instructions for the Program Assessment Rating Tools," April 18, 2002.
19. Office of Management and Budget, Federal Enterprise Architecture Program Office, "The Business Reference Model Version 1.0: A Foundation for Government-wide Improvement," 2002.